

Appl. No.: 10/691,368

Amdt. Dated: 01/19/2007

Reply To Final Office Action Mailed: 10/19/2006

Reply Under 37 CFR 1.116

Expedited Procedure

AMENDMENTS TO THE CLAIMS

To place the application in condition for allowance, please cancel claims 17-24, without prejudice or disclaimer. Please also amend claims 1 and 12 as indicated to correct typographical omissions. The claim set below replaces all prior versions and listings of the claims in the above-referenced patent application.

1. (Currently Amended) A method of manufacturing a wire comprising:
filling a hole in a metal tube with magnesium;
sealing the ends of the tube;
deforming the tube to increase its length; and
contacting the tube with boron to react the magnesium with the boron to form superconducting magnesium diboride.
2. (Original) The method of Claim 1, wherein the magnesium is in the form of magnesium rods, pellets, powder, particles, flakes, or a combination thereof, and wherein the metal tube comprises copper, copper alloys, stainless steel, tantalum, magnesium, or nickel alloys.
3. (Original) The method of Claim 1, wherein the ratio of a radius of the hole to the radius of the tube is about 0.1 to about 0.99, prior to the deforming.
4. (Original) The method of Claim 1, wherein the metallic tube does not react with boron, and wherein the metallic tube permits the diffusion of boron.
5. (Original) The method of Claim 1, wherein the metallic tube further comprises additional non-intersecting holes that extend from a first end of the tube through to the second end of the tube and wherein at least one of these holes is filled with the magnesium prior to the deforming process.

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6. (Original) The method of Claim 1, wherein the deforming is by extrusion, forging, rolling, swaging, drawing or a combination comprising at least one of the foregoing processes.
7. (Original) The method of Claim 6, wherein the deforming results in an increase of a unit length of the metal tube in an amount of greater than or equal to about 10% after the deforming.
8. (Original) The method of Claim 1, wherein the boron is in the form of a vapor or a liquid.
9. (Original) The method of Claim 1, further comprising heat treating the wire at a temperature of greater than or equal to about 600°C for a time period of greater than or equal to about 1 hour.
10. (Previously Presented) A method for making a superconducting wire comprising: contacting a boron filament, tape or a combination of a filament and a tape with molten magnesium to form a magnesium diboride wire, wherein the boron substrate is intermittently contacted with the molten magnesium.
11. (Original) The method of Claim 10, wherein the boron filament has a characteristic dimension of about 1 to about 1,000 micrometers.
12. (Currently Amended) The method of Claim 10, wherein the boron substrate is contacted with the molten magnesium at a temperature of about 650 to about 1090°C.
13. (Canceled)
14. (Original) The method of Claim 10, wherein the molten magnesium comprises dopants, and wherein the dopants are copper, gold, silver, magnesium, zinc, lead, cadmium, tin, bismuth, gallium, mercury, indium or combinations comprising at least one of the foregoing dopants.
15. (Original) The method of Claim 10, wherein the filament is a film.

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16. (Original) The method of Claim 10, wherein the filament may be further deformed into a film or a tape.

17. – 30. (Canceled)